

Appl. 10/656,802  
Amnd dated August 23, 2004  
Reply to Office Action of July 8, 2004

**Remarks/Arguments**

With entry of this Amendment, claims 1, 4-5, 8-47, 50-58, 60-73 and 76-93 are pending in the instant application. Claims 2, 3, 6, 7, 48, 49, 59, 74, 75 and 94-165 have been canceled herein without prejudice or disclaimer, and claims 1, 5, 9, 13, 14, 15, 16, 21, 32, 33, 34, 37, 38, 39, 41, 44, 47, 50, 53, 56, 57, 58, 60, 61, 62, 63, 64, 66, 69, 71, 76, 77, 78, 79, 80, 83, 84, 89, 90 and 91 have been amended. Claims 94-165 were withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a non-elected invention. Election was made by Applicants without traverse in the reply filed on May 11, 2004. Accordingly, Applicants hereby cancel claims 94-165 without prejudice or disclaimer. Applicants expressly reserve the right to pursue claims 94-165 (and/or cancelled claims 2, 3, 6, 7, 48, 49, 59, 74 and 75) in one or more continuing applications claiming priority to the instant application.

As an initial matter, Applicants would like to thank the Examiner for the courtesy extended to the undersigned in conducting an Examiner interview on August 20, 2004 in which amended independent claims 1 and 47 were discussed in view of the art cited by the Examiner. As discussed with the Examiner, independent claim 1 has been amended to recite that the first population of nanostructures recited therein comprises nanorods that are not grown from either the first or second electrode layer. In addition, independent claim 47 has been amended to recite among other things that the first population of nanostructures recited therein comprises nanotetrapods that are not grown from either the first or second electrode layer. As discussed with the Examiner, there is replete support throughout the specification and Figures for the instant amendments to claims 1 and 47 (as well as to amended dependent 1, 5, 9, 13, 14, 15, 16, 21, 32, 33, 34, 37, 38, 39, 41, 44, 47, 50, 53, 56, 57, 58, 59, 60, 61, 62, 63, 64, 66, 69, 71, 76, 77, 78, 79, 80, 83, 84, 89, 90 and 91 which depend respectively therefrom), and thus no new matter is introduced into the application by reason of such amendments.

**I. Objections to the Drawings**

The drawings were objected to as failing to comply with 37 CFR 1.84(p)(5) because they allegedly did not include reference characters 854a and 854b at

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page 44, third line from the bottom. The specification has been amended herein to correct inadvertent errors in incorrectly using reference numerals 854a and 854b (which should have been referred to as 856 and 858, respectively, which are labeled appropriately as light sources in Figure 8C), and thus Applicants note that there is no necessity to submit corrected drawing sheets in reply to this objection.

## **II. Objections to the Specification**

The specification disclosure was objected to for a few minor informalities. The specification has been amended herein in full compliance with the Examiner's suggestions to obviate such grounds for objection.

## **III. Objections to the Claims under 35 U.S.C. Section 112**

Claims 3, 21, 39, 71, and 75 were rejected under 35 U.S.C. Section 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. First, with respect to claims 3 and 75, such claims have been cancelled without prejudice herein, and thus the rejection is now moot with respect to those claims. In addition, claims 21, 39 and 71 have been amended herein to fully address the Examiner's grounds of rejection with respect to those claims, and thus the Section 112 grounds of rejection of the claims should now be obviated.

## **IV. Claim Rejections under 35 U.S.C. Sections 102 and/or 103**

Claims 1-93 were rejected under 35 U.S.C. Section 102(b) as allegedly being anticipated by Motohiro et al., U.S. Patent No. 5,571,612 ("Motohiro"). Claims 1-46 were rejected under 35 U.S.C. Section 102(e) as allegedly being anticipated by Kalkan et al., U.S. Patent Application Publication 2002/0192441 ("Kalkan"). Claims 1-93 were rejected under U.S.C. Section 102(e) as allegedly being anticipated by Curtin, U.S. Patent Application Publication 2004/0003838 ("Curtin"). Claims 1-93 were rejected under U.S.C. Section 102(b) as allegedly being anticipated by, or in the alternative, obvious under 35 U.S.C. Section 103 over, Den et al., EP 1087446 A2 ("Den"). Claims 47-93

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were rejected under 35 U.S.C. Section 103(a) as allegedly being obvious over Yoshikawa, U.S. Patent Application Publication No. 2002/0040728 ("Yoshikawa").

In addition, it should be noted for the record that a "Protest by a Member of the Public" under 37 CFR 1.291 has been filed against the instant application on July 27, 2004. The art cited in the Protest, i.e., Kalkan et al., U.S. Patent Application Publication 2002/0192441 and Den et al., EP 1087446 A2, has already been submitted to the Examiner in an IDS and was also cited by the Examiner in the present Office Action as noted above. As discussed with the Examiner in the telephone interview of August 20, 2004, none of the references relied on by the Examiner (and included in the subject Protest) teach or render obvious the limitations of amended independent claims 1 and 47.

As previously noted, claim 1 has been amended to recite that the photoactive layer of the claimed photovoltaic device comprises (among other things) "a first population of nanostructures comprising nanorods which are not grown from the first or second electrode layer." Independent claim 47 has been amended to recite that the photoactive layer of the claimed photovoltaic device comprises a mixed population of nanostructures having a type II band offset energy profile including "a first population of nanostructures comprising nanotetrapods which are not grown from the first or second electrode layer." None of the references cited by the Examiner teach or render obvious at least these aspects of amended claims 1 and 47.

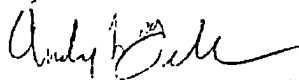
For example, as discussed with the Examiner, Motohiro, Kalkan, and Den, to the extent that such references disclose crystal structures that can even be considered nanorods and/or nanotetrapods as those terms are defined in the instant application -- which Applicants do not concede -- do not disclose (among other things) nanorods and/or nanotetrapods in the photoactive layer that are not grown from the first or second electrode layer. In addition, Curtin and Yoshikawa do not disclose any elongated crystal structures at all in the photoactive layer of the disclosed devices.

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Accordingly, for at least these reasons, Applicants submit that claims 1 and 47, as well as pending dependent claims 4-5 and 8-46, and 50-58, 60-73 and 76-93 which depend respectively therefrom, are not anticipated by and/or made obvious over the references cited by the Examiner, and respectfully request that the rejection of the claims be reconsidered and withdrawn.

In view of the foregoing amendments and remarks, Applicants believe that the present application is in condition for allowance and action toward that end is respectfully requested. If the Examiner believes that a telephone interview would expedite the examination of this application, the Examiner is requested to contact the undersigned at the telephone number below.

Respectfully submitted,



Andrew L. Filler  
Reg. No. 44,107

NANOSYS, INC.  
2625 Hanover Street  
Palo Alto, CA 94304  
Tel. (650) 331-2176  
Fax (650) 331-2191